

July, 1876, commences with a continuation of A. Serpieri's paper on the observation of the zodiacal light, by G. Jones.—Father Secchi contributes a second note on the change of position of the lines in stellar spectra due to the motion of the stars. The author in this, as in the last note, throws doubt on the reliability of the method in practice.—Observations of solar protuberances made during the first half of the present year at Rome. This consists of a table showing the number of prominences seen on each 10° of solar circumference, the height, size, and area of the prominences, and the extension of faculae.—Spectroscopic and direct observations made at Palermo in the months of June and July. This paper includes a table showing the number of spots and faculae on each day, with notes of the positions in which the δ and 1474 lines were seen.

August, 1876, contains three papers by Prof. Ricco, the first of considerable length, on the absorption spectrum of water, with a plate showing the method of experiment and the spectrum of sea-water seen; the second on the spectral study of the green of plants; and the third on a new form of direct-vision spectrocope. In this new form the rays of light from the collimator pass through a prism of 60° in the ordinary way; they then fall on the side of a prism of 90°, having its base nearly in the same plane as that of the first; they are thus totally reflected internally from the base of the prism, and emerge from the other face parallel to their original position.

Reale Istituto Lombardo di Scienze e Lettere. Rendiconti. April—July.—A controversy which has been going on between M. Lombroso and a Committee of the Institute as to the poisonous properties of decayed maize and the disease of pellagra (in Northern Italy) is referred to here.—In the treatment of vines with sulphur for oidium, the destruction of the parasite has been shown to be due to formation of sulphydric acid. Whether the necessary hydrogen came from the oidium or from the grapes was uncertain, till it appeared that grapes that were quite free from the disease, gave sulphuretted hydrogen when sprinkled with sulphur. M. Selmi proved the development of nascent hydrogen from mould, and M. Polloni, having experimented on a number of plants, now sprinkled with sulphur, gave sulphydric acid. Most of it is produced in those parts in which the vegetation is most active (as the flowers and young buds). Plants with saccharine fruit (as the vine and mulberry) do not produce it in greater quantity than others. The author concludes from indirect experiments that all plants, in certain phases of their growth, and as the result of physiological acts, produce hydrogen in the nascent state.—A valuable paper of statistics and information regarding diphtheria in Milan, in the three years 1873, 1874, 1875, is contributed by Dr. Felice Dell'Acqua. With reference to meteorological conditions, it is concluded that neither the maximum nor the minimum of air pressure, of temperature, of vapour tension and relative moisture, seemed to have the least influence in raising the number of cases of diphtheria. In winter and autumn the number of individuals taken ill was less, but the less number of deaths was in spring and summer.—M. Montegazza gives a careful analysis of the phenomena of expression of grief.—The course of storms is studied by M. Frisiani.—In biology we find notes on the nucleoli in the envelopes of some Protozoa, the mieline in Infusoria, the fresh-water Rhizopods of Lombardy.

Zeitschrift für Wissenschaftliche Zoologie, vol. xxvii., Part 2.—Prof. Selenka opens this number with a very interesting contribution to the embryology of the Holothurians, accompanied by beautiful figures. He describes the early stages of *Holothuria tubulosa* and *Cucumaria doliolum*. Among his conclusions may be mentioned the following:—The mesoderm arises entirely out of the entoderm; the mesoderm gives off motile cells from which the subcutaneous circular muscles, the primary alimentary canal, and parts of the internal skeleton are formed; the first-named species undergoes complete, the second incomplete metamorphosis; the transformation of Echinoderm larvæ can only be regarded as metamorphosis, not as alternation of generations.—Prof. Salensky, of Kasan, contributes a monograph of the development of *Salpa democratica*, from fecundation to the establishment of all the organs. At the conclusion of his paper he discusses the evidence which embryology affords as to the true position of the Salpæ. He shows that they lack the provisional organs as well as the mantle and foot, found in all mollusca. The cellulose test is in no way homologous with the molluscan mantle. The respiratory cavity is simply a differentiated part of the alimentary canal. The author considers the Vermes also to be nearer the Mollusca

than the Salpæ, by reason of the provisional organs of many of their embryos. He emphasises the differences between the development of the Salpæ and the Ascidians, and, allowing that the viviparous reproduction of the Salpæ may account for much, he thinks that we are still considerably in the dark on the matter. He makes no allusion to the hypothesis that the Lunicata may be degenerate Vertebrates.—Ernst Zeller gives an account of the anatomy and life history of *Polystomum integerrimum*, a Nematode worm which inhabits the urinary bladder of frogs in its adult condition, and is found in the respiratory cavity of tadpoles during its larval state. Migration takes place through the alimentary canal of the host when the frog has undergone its metamorphosis; some individuals become sexual while in the respiratory cavity; these do not migrate, are short-lived, and do not appear to mature their eggs.

Gegenbaurs' *Morphologisches Jahrbuch*, vol. ii., Part 1.—Dr. von Ihering, of Göttingen, has an important article on Gasteropods, expounding the structure of the opisthobranchiate *Tethys leporina*, and making deductions equally unfavourable to the views of Prof. Huxley on morphology, and of Haeckel on phylogeny. He sees no ground for believing that the larval velum is the fore part of the epipodium, and expresses his astonishment that Prof. Huxley's paper on the morphology of the cephalous mollusca should be deemed authoritative. Haeckel's dogmatic system of phylogeny is stated to be not in accord with facts as regards the mollusca. The author believes that the prosobranchiate Gasteropods are derived from segmented worms, the opisthobranchiates from flat worms.—R. Hertwig endeavours to unify the differences in the structure, behaviour, and mode of formation of nuclei.—A brief contribution on the Coelenterata, by G. v. Koch, is noticeable as describing a mesoderm in *Hali-sarca*.—Dr. W. Rolph has a long account of Amphioxus, increasing its abundant literature by nearly eighty pages, illustrated by three plates. He claims to have made it clear that its "body cavity," formed by the downgrowth of lateral lobes, is a respiratory cavity, homologous with the perivisceral chamber of ascidians, with the respiratory cavity of the tadpole, and the gill-cavity of symbranchii. He strongly objects to the identification of this chamber with the proper body-cavity of Vertebrata.

SOCIETIES AND ACADEMIES

LONDON

Entomological Society, October 4.—Sir Sidney Smith Saunders, C.M.G., vice-president, in the chair.—M. Alfred Preudhomme de Borre, secretary of the Belgian Entomological Society, was elected a foreign member.—Mr. Bond exhibited varieties of *Hepialus humuli* and *Epunda ululenta*, and also specimens of the new Tortrix (*Sericoris irriguana*), all taken near Loch Laggan by Mr. N. Cooke.—Mr. Forbes exhibited a weevil (evidently not indigenous to Britain) taken alive among some orchids at Highgate. Mr. Pascoe pronounced it to be a species of *Cholus*, a South American genus, for which he proposed the name of *C. Forbesii*.—Mr. W. Cole exhibited numerous bred specimens of *Eunomos angularis*, showing differences in coloration according as the larvæ had been fed on oak, hawthorn, lime, or lilac.—Mr. Enock exhibited microscopic slides containing some beautiful preparations of minute species of *Hymenoptera*.—Mr. Frederick Smith communicated "Descriptions of new species of Cryptoceridæ belonging to the genera *Cryptocerus*, *Meranoplus*, and *Catantulus*," accompanied by figures of the several species. The author gave some interesting particulars relative to the habits of these insects, especially of *Meranoplus intrudens*, which constructs its fornicarium in the thorns of a species of *Acacia*. These thorns were some 4 or 5 inches in length, and at a distance of about half an inch from the pointed end, a small round hole was made for ingress and egress to and from the nest. The thorns contained a kind of spongy pith in which the channels and chambers of the nest were constructed.—A catalogue of the British Hemiptera (Heteroptera and Homoptera) compiled by Messrs. J. W. Douglas and John Scott, published by the Society, was on the table.

MANCHESTER

Literary and Philosophical Society, October 3.—Rev. William Gaskell in the chair.—On the action of water and saline solutions upon lead, Part 2, by M. M. Pattison Muir, F.R.S.E., Assistant Lecturer on Chemistry, Owens College. It appears

to be shown by Mr. Muir's experiments that the solvent action of dilute saline solution upon lead tends to attain a maximum when large surfaces of liquid are exposed to the surrounding air, and when the volume of liquid is large in proportion to the surface of lead exposed. Further, that under these conditions, and in the presence of those salts which aid the action—especially nitrates and more especially ammonium nitrate—the quantity of lead dissolved increases in an increasing ratio with the time during which the action is allowed to proceed.

PARIS

Academy of Sciences, October 9.—Vice-Admiral Paris in the chair. The following papers were read:—On the absorption of free nitrogen by the immediate principles of plants, under the influence of atmospheric electricity, by M. Berthelot. He used, this time, the weaker normal electric tension in the atmosphere. One closed tube of thin glass was inclosed in another. In the former was a roll of platinum joined to a conductor electrified by the atmosphere (at a height of 2 metres), while a thin sheet of tin round the outer tube was connected to earth. Into the annular space was (previously) introduced pure nitrogen or ordinary air, along with moist strips of blotting paper or a few drops of syrupy solution of dextrine. Twelve tube-systems, varying as described, were connected in position, from July 29 to October 5; the mean electric tension being that of 34 Daniell elements, but oscillating from + 60 D to - 180 D. In all the tubes nitrogen was fixed by the organic matter—one to several millimetres per tube. In two cases green spots of microscopic algae were found on the strips of moist paper in nitrogen tubes, showing a greater fixation of nitrogen in these. The experiments indicate an influence, little suspected hitherto, in vegetation.—Note on capillary affinity, by M. Chevreul. The name comprises all cases of union of a solid with a gas, a liquid, or a body held in solution by a liquid, where the solid retains its apparent form. The present note refers to action of massicot or calcined litharge on lime, strontium, or baryta water. The facts of capillary attraction are specially important for agriculture.—On the action which boric acid and the borates exert on plants, by M. Peligot. French beans watered once with solutions of borate of soda or potash, or boric acid, soon withered and died. It doubts if a substance so deleterious to plants can be innocuous to animals, where used to preserve meat.—On the reciprocal action of oxalic acid and monoatomic alcohols, by MM. Cahours and Demarçay. Where oxalic acid is caused to act on a mixture of propylic and isopropylic alcohols, propylic oxalate is produced almost exclusively. If the corresponding alcohols be extracted from this mixture of oxalates by saponification, a mixture rich in propylic alcohol is had, which, etherified anew by oxalic acid, furnishes oxalate of propyle almost pure. Hence we have a very simple mode of separation for two alcohols, which it would be almost impossible to separate by present processes.—On the stercoral anguillule, by M. Bavaz. This is the nematoid found in the stools of patients subject to diarrhoea of Cochín China. It is closely related to the *Rhabditis terricola*, Dujardin. It has been met with in the stomach, pancreatic duct, choledochus, hepatic ducts, and the walls of the gall-bladder, and in at least thirty patients.—On the flow of blood by tubes of small calibre (transpirability of Graham), by M. Haro. Heat accelerates the flow of defibrinated blood, and more so the richer the blood is in corpuscles; on serum heat acts much as on distilled water. Defibrinated blood which has had a current of CO₂ passed through it some time, and has then been filtered through fine linen, flows more slowly than the same blood made rutilant by decantation in free air. Sulphuric ether, containing no trace of alcohol, retards the flow of defibrinated blood, serum, and water. Chloroform retards the flow of water and serum, while it favours that of defibrinated blood. These facts have important physiological bearings.—Geological study of the prehistoric grottoes of Graulx, in their relation to thermal waters, by M. Saubert. The latter are shown to be the cause of the former.—New observations on the Phylloxera of the oak, compared with that of the vine, by M. Balbiani. The new facts prove a great resemblance between the two in their habits and the phenomena of their reproduction.—Results obtained in treatment of phylloxerised vines with sulphide of carbon; measure in which this treatment should be applied, by M. Allies.—On the orders and classes of certain geometrical positions, by M. Halphen.—Determination of nitric acid in organic substances; chemical composition of certain gun-cottons, by MM. Champion and Pellet. Organic

substances containing nitrogen are completely reduced, in certain conditions, by ferrous salts, and behave like nitrates. Hence, to determine the nitrogen, the authors adopt a modification of the process of Pelouze or Schloesing. The composition assigned to gun-cotton corresponds to the pentanitrocellulose of Pelouze, C₂₄H₁₅O₁₅N₅O₉, not trinitrocellulose (Abel).—On the limits between which fire-damp explodes, and on new properties of palladium, by M. Coquillion. The first limit, with excess of fire-damp, is 1 of fire-damp to 6 of air; the second, with excess of air, 1 of fire-damp to 16 of air. Palladium may with impunity be raised to a red heat in one of the most defonant mixtures known.—Note on the crystalline form of melinophane, by M. Bertrand.—The formula of seiches, by M. Forel.

GENEVA

Society of Physics and Natural History, September 7.—M. Raoul Pictet described observations by him made on an intermittent fountain in the neighbourhood of Vichy, department of Allier. The case under consideration does not belong to the class which may be accounted for by the ordinary explanation of a siphon charging and discharging itself subterraneously. The fountain is here projected at intervals from an artificial vertical hole pierced in the ground to the depth of more than 100 metres. Other borings made in the locality tend to prove that there exists at that depth an underground collection of water, under pressure, which permanently maintains the level of the water in the tube at three or four feet below the level of the ground. At intervals occurring four or five times during the day, bubbles of gas begin to rise in the liquid; then, in the space of two seconds, the water rushes out in force, and for a certain time to a height of twelve metres. No siphon hypothesis can be applied to the locality; the phenomenon must be explained by a mechanical action of another kind. M. Pictet supposes the pressure of the subterranean gas to accumulate above the surface of the water underneath. In certain places the surface of the earth above may present hollows the upper part of which is at a higher level than the lower orifice of the tube. The pressure increasing, gas may then enter the tube, diminishing the pressure of the liquid, which causes equilibrium with the subterranean pressure, and effecting an emission of water which will last until that equilibrium is restored. M. Pictet has devised an apparatus to prove his theory and which completely illustrates it. (Vide *Archives des Sciences Physiques et Naturelles*, September, 1876.)

CONTENTS

PAGE

MAUDSLEY'S "PHYSIOLOGY OF MIND." By DOUGLAS A. SPALDING . . .	541
OUR BOOK SHELF:—	
"Annual Record of Science and Industry for 1875"	543
"Causeries Scientifiques"	543
LETTERS TO THE EDITOR:—	
The Self-fertilisation of Plants.—Rev. GEORGE HENSLOW . . .	543
Wallace's "Geographical Distribution of Animals."—RICHARD	
LYDEKKER	544
The Resistance of the Electric Arc.—W. E. AYRTON; JOHN	
PERRY	544
Habits of Animals Transmitted to Offspring.—THOMAS H.	
POTTS	544
Moon-Stroke.—E. BONAVIA, M.D.	545
The Memoirs of the Geological Survey.—WM. HORSFALL . . .	545
OUR ASTRONOMICAL COLUMN:—	
Chacornac's Variable Nebula near ζ Tauri	545
Olber's Supposed Variable in Virgo	545
Relative Brightness of Uranus and Jupiter's Satellites . . .	545
Blanpain's Comet, 1879	545
PROF. HUXLEY ON UNIVERSITY EDUCATION	546
REV. MARK PATTISON ON UNIVERSITY REFORM	550
THE FIFTH MEETING OF RUSSIAN NATURALISTS	552
PRINCIPLES OF TIME-MEASURING APPARATUS. II. By H. DENT	
GARDNER. (With Illustrations)	554
CROOKES'S RADIOMETER. By Dr. E. FRANKLAND, F.R.S	556
GEOLOGY OF ENGLAND AND WALES. (With Illustrations) . . .	556
SUMNER'S "METHOD AT SEA"	559
NOTES	559
SCIENTIFIC SERIALS	562
SOCIETIES AND ACADEMIES	563